

THE GORDON CONFERENCE ON INORGANIC CHEMISTRY 1990**Final Program Report**

The 1990 Gordon Conference on Inorganic Chemistry was held at Brewster Academy, Wolfboro, New Hampshire from July 30 to August 3 1990 and had as its themes: the chemistry of inorganic molecular clusters, the chemistry of supermolecular inorganic materials, chemistry at inorganic surfaces, and reactive intermediates in inorganic chemistry. Twenty two papers were presented, plus an unscheduled contribution from the vice-chair at the end of the final session. Two poster sessions were held, comprising about forty posters. Invited speakers and session chairs were drawn from research groups in academia, industry and National Laboratories, and the program brought together world class chemists from the United States, Britain, France, West Germany, Canada and the U.S.S.R., in keeping with the worldwide level of research activity in these areas. The international scope of the program was greater than had been attempted in previous years for this conference.

The Conference was attended by ninety-eight registrants, and in addition to the customary mix of academic and industrial scientists, a significant number of graduate students and post-doctoral fellows attended. This was undoubtedly due to a well publicised offer of financial support for selected students and post-docs, awarded on the basis of poster presentations. As a result the poster sessions were of a uniformly high quality and gave to junior conferees a good opportunity to expose their work in an informal but scientifically rigorous atmosphere.

The Conference was characterized by particularly stimulating discussions between chemists in related but distinct areas of inorganic chemistry. Both after the formal talks and in the free discussion periods these interactions were evident, and they will lead to new initiatives, particularly in the areas of inorganic materials, cluster chemistry and catalysis. This was made clear to the organizers in the comments of the attendees, many of whom were delighted to find their work so relevant to chemists in what had previously seemed unrelated fields.

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91-05932

GORDON RESEARCH CONFERENCE
Inorganic Chemistry
Brewster Academy, Wolfboro, NH
July 30 - August 3 1990

John S. Bradley, Chairman

Richard D. Adams, Vice Chairman

July 30, 1990

8:45 a.m.

The Chemistry of Inorganic Clusters

Duward F. Shriver, Discussion Leader

- | | |
|--|--|
| 1. Larry F. Dahl
University of Wisconsin
Madison | Experimental - Theoretical Studies of
Small to Giant Transition Metal Clusters:
Problems and Solutions |
| 2. Boon Teo
University of Illinois
Chicago | Gold Fusion: From Clusters to Clusters
of Clusters |
| 3. D. Michael P. Mingos
Oxford University | Synthesis, Structure and Bonding in
Metal Clusters |

7:30p.m.

- | | |
|--|--|
| 4. Richard Finke
University of Oregon
Eugene | Polyoxoanions as New Materials for
Atomically Dispersed Transition Metal
Catalysts: Synthesis, Characterization,
Catalytic Activity and Mechanism |
| 5. Pierre Braunstein
Louis Pasteur University
Strasbourg | Molecular Aspects of the Metal-Metal
Bond |
-

July 31, 1990

9:00 a.m.

The Chemistry of Inorganic Clusters (contd.)

Wayne Gladfelter, Discussion Leader

- | | |
|--|---|
| 1. Thomas P. Fehlner
University of Notre Dame | Transition Metal-Main Group Clusters and
Solid State Materials |
| 2. Suzanne Harris
Exxon Corporate Research | Bonding in Heterometallic Clusters |

Supramolecular Inorganic Chemistry

- | | |
|--|--|
| 3. Brian F. G. Johnson
Cambridge University | Metal Clusters, Particles and Crystallites |
|--|--|

7:30p.m.

- | | |
|---|---|
| 4. Michael Steigerwald
AT&T Bell Laboratories | Molecular Routes to Solid State Compounds |
| 5. Thomas Bein
University of New Mexico
Albuquerque | Synthesis and Characterization of
Clusters and Organometallics in Zeolites |

August 1, 1990

Supramolecular Inorganic Chemistry(contd.)

9:00 a.m. John Bradley, Discussion Leader

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|--|--|
| 1. Reinhard Kremer
Max Plank Institute
Stuttgart | Electronic Delocalization and Spin
Properties in Lanthanide Compounds with
Discrete and Condensed Clusters |
| 2. Jeremy K. Burdett
University of Chicago | Some New Theoretical Ideas Linking
Molecules, Surfaces and Solids |
| 3. Ilya I. Moiseev
N. S. Kurnakov Institute of
General and Inorganic Chemistry
Moscow | Synthesis, Structure and Catalytic
Activity of Giant Palladium Clusters |

7:30 p.m.

- | | |
|--|---|
| 4. Larry Lewis
General Electric Corporate
Research and Development | Preparation and Characterization of
Platinum Group Metal Colloids:
Crossroads Between Clusters and Surfaces |
| 5. Günther Schmid
Institute for Inorganic
Chemistry
Essen | Large Transition Metal Clusters and
Colloids: Bridges between Homogeneous
and Heterogeneous Catalysis |
-

August 2, 1990

Inorganic Chemistry On and In Inorganic Solids

9:00 a.m. Robert J. Madix, Discussion Leader

- | | |
|--|---|
| 1. Ralph Nuzzo
AT&T Bell Laboratories | Structure-Reactivity Correlations in
Surface Organometallic Chemistry |
| 2. Cynthia M. Friend
Harvard University | Mechanistic and Structural Surface
Chemistry |
| 3. Laurent Bonneviot
Laval University
Quebec | Preparation, Structure and Stability
of Transition Metal Ion Deposits on
Amorphous Silica |

7:30p.m. Robert J. Madix, Discussion Leader

- | | |
|---|--|
| 4. Thomas E. Mallouk
University of Texas
Austin | Light Driven Electron Transfer
Reactions in Microporous Solids |
| 5. Shirley Chiang
IBM Research Division
Almaden | Scanning Tunneling Microscopy of
Adsorbed Molecules on Surfaces |
-

August 3, 1990

Mechanistic Investigations in Inorganic Chemistry

9:00 a.m. R. D. Adams, Discussion Leader

- | | |
|--|--|
| 1. Robin N. Perutz
University of York | Plotting the Course of C-H Activation
Reactions-Reactive Intermediates in
Organometallic Chemistry |
| 2. John R. Shapley
University of Illinois
Urbana | Pressure Tuning Spectroscopy -
Applications in Metal-Metal Bonded
Systems |
| 3. Wrap-up and Discussion | |

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Aufdembrink, Brent	off site		Li, Yong-Xi	Lamb	3
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Basolo, Fred	House 1	6	Lyon, David K.	Sargent	310
Bein, Thomas	Brown	7	Madan, Stanley K.	Sargent	203
Bolinger, C. Mark	Sargent	301	Madix, Robert J.	Lamb	5
Bonneviot, Laurent	Brown	4	Mallouck, Tom	Brown	5
Bradley, John	Kupper	1	Marcus, M.	Sargent	202
Braunstein, Pierre	House 1	3	Martin, Andrea E.	House 3	7
Briggs, John	off site		Matuszko, Anthony J.	House 2	5
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Chan, Edith	House 3	1	Millar, John M.	Sargent	205
Chiang, Shirley	off site		Mingos, D.M.P.	Brown	10
Collins, Gary S.	Sargent	107	Moiseev, Ilya I.	Vaughn	1
Cowley, Alan	House 1	7	Nuzzo, Ralph G.	Brown	3
Czech, Paul T.	Vaughn	3	Parry, Robert	Kupper	5
Dahl, Lawrence F.	Brown	9	Perutz, Robin N.	Estabrook	4
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Dunham, Stephen	Sargent	305	Proserpio, David M.	Vaughn	5
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Fackler, John P.	Kupper	4	Richard, Michael A.	Sargent	206
Faessler, Thomas F.	Vaughn	3	Samkoff, Deborah E.	House 3	1
Farr, James	Sargent	107	Schauer, Cynthia K.	House 3	2
Fehlner, Thomas P.	Estabrook	6	Schmid, Gunter	House 1	1
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Fisher, Barbara	Estabrook	2	Shore, Sheldon G.	Sargent	303
Friend, Cynthia	Lamb	5	Shriver, D.F.	Lamb	1
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Hagen, Karl S.	Sargent	307	Strauss, Steven H.	Harris	2
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1990 GORDON CONFERENCE ON GLASS
TILTON, NEW HAMPSHIRE
JUNE 25-29, 1990

FINAL REPORT
Robert J. Eagan, Chair

The 1990 Gordon Conference on Glass, entitled "Defects in Glass" successfully integrated scientific studies performed by scientists in the "classical" glass community, the semiconductor community, and several involved in peripheral work, e.g., the surface force interactions of water with inorganic materials. Several previously unreported or unrecognized observations were reported. Three examples are:

- 1) The possible relationship of E' (optical defect) centers to fracture propagation emerged for the first time and will lead to further collaborative studies.
- 2) New nucleation and crystallization data for zinc fluoride glasses, obtained with a novel heating stage and optical microscope, were presented.
- 3) Surface force interaction measurements may lead to understanding electronic defects in silica films—a surprise to the presenter! New collaborations will undoubtedly develop.

The attendees and presenters represented industry, academia (students and faculty), national laboratories, and several scientists from Europe and Japan. Eighteen speakers were joined by twenty-four participants in two poster sessions. The nine discussion leaders did a good job leading frequently spirited discussions. Total attendance was eighty, including five from Europe and Japan.

Enclosure:
Program

WK=West Knowles
EK=East Knowles
M=Moore Hall
P=Pheiffer

GORDON RESEARCH CONFERENCES

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June 17 - 22, 1990

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.I.
y NY 12180

GORDON CONFERENCE ON GLASS

Senior Poster Session - Tuesday Evening

<u>Author/Institution</u>	<u>Poster Title</u>
R. J. Araujo Corning, Inc.	Statistical Mechanical Calculation of Peroxyl in Silica
R. Cooper University of Wisconsin	Chemical Diffusion and Crystalline Nucleation in Transition-Metal-Doped Aluminosilicates
J. T. Dickinson, S. C. Langford, and L. C. Jensen Washington State University	Consequences of Simultaneous Bombardment of Sodium Trisilicate Glass With UV Excimer Irradiation and keV Electrons
D. Inniss, D. Brownlow, C. Kurkjian AT&T Bell Laboratories	The Strength and Fatigue of Silica Fibers in Sodium Chloride Solutions
A. A. Kruger Battelle Pacific Northwest Lab.	The Effect of Surface Treatments of Silica and Silicate Glass Fibers on Their Mechanical Properties
C. Kurkjian, R Farrow, D. Inniss AT&T Bell Laboratories	High Resolution Scanning Microscopy of Glass Fiber Surfaces
W. Moddeman EG&G Mound Applied Technologies	Zero Valent Nickel in Glass
K. Nagasawa Sagami Institute of Technology	The Cause of the Intrinsic Luminescence at 2.7 eV in Pure Silica Glass
S. V. Raman and K. Matsuishi Texas Center for Superconductivity	Glass-like Structural Relaxation in Crystalline $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$ Perovskite Structure
J. Simmons University of Florida	XPS Studies of Fluoride Glass Films
P. A. Tick, T. Kanamori S. Mitachi, S. Takahashi, R. Maschmeyer, K. Lu Corning, Inc.	Hot Stage Optical Microscopy (includes video presentation)

1990 Gordon Conference on Glass
June 24-29, 1990
The Tilton School
Tilton, New Hampshire

PROGRAM

Chair: Robert J. Eagan

Vice-Chair: Marvin J. Weber

Monday, June 25, 1990

Discussion Leader	Robert J. Eagan	
Speaker	David Turnbull	Physics & Chemistry of Glass Formation
Speaker	C. Jeffrey Brinker	Structure of Sol Gel Silicate Glasses
Speaker	John Batey	Structural Properties of Thin Film, PECVD SiO ₂
Discussion Leader	Richard K. Brow	
Speaker	Kenneth P. Kelton	Nucleation & Phase Separation in Glasses
Speaker	Minoru Tomosawa	Water & Defects in Glass

Tuesday, June 26, 1990

Discussion Leader	Suresh Gulati	
Speaker	Terry A. Michalske	The Role of Strain Induced Defects in the Fracture of Silica Glass
Speaker	J. Thomas Dickinson	Fracture-emission from Glass Surfaces & Interfaces
Speaker	Charles R. Kurkjian	Strength Degradation in High Strength Fibers
Discussion Leader	Marvin J. Weber	
Poster Session	Senior Scientist/Faculty Posters and Discussion	

Wednesday, June 27, 1990

Discussion Leader	Robert J. Eagan	
Speaker	Tetsuro Isumitani	Defects on the Surface of Optical Glasses
Speaker	Douglas T. Smith	Surface Forces in SiO ₂ - Water Interactions
Speaker	Jon K. West	Silica Cluster Models
Discussion Leader	James E. Shelby, Jr.	
Poster Session	Student Posters and Discussion	

Thursday, June 28, 1990

Discussion Leader	Joseph Simmons	
Speaker	Douglas Allan	Structure & Defects in Oxides by Electronic Structure/Total Energy Methods
Speaker	Frank L. Galeener	X-ray Induction of Spin Active Defects in Vitreous Silica
Speaker	Kasuo Arai	Nature of Defects of Doping in Silica Glasses
Discussion Leader	Norbert J. Kreidl	
Speaker	Deibert E. Day	Targeted Radiation Therapy in Humans Using Glass Microspheres

Friday, June 29, 1990

Discussion Leader	Tetsuro Isumitani	
Speaker	David L. Griscom	Physics & Chemistry of Defects in Silica Glass & At the Si/SiO ₂ Interface
Speaker	Patrick Lenahan	Detection of Defects in Glass: Electronic Measurements
Speaker	Andrejs R. Silin	Point Defects: Radiation Induced Defects in SiO ₂

Senior Poster Participants:

Albert A. Kruger	The Effect of Surface Treatments of Silica and Silicate Glass Fibers on Their Mechanical Properties
K. Nagasawa	The Cause of the Intrinsic Luminescence at 2.7 eV in Pure Silica Glass
S. V. Raman	Glass-like Structural Relaxations in Crystalline $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$ Perovskite Structure
P. A. Tick	Hot Stage Optical Microscopy
D. Inniss	title unavailable
R. J. Araujo	Statistical Mechanical Calculation of Peroxyl in Silica
Reid Cooper	Chemical Diffusion and Crystalline Nucleation in Transition-Metal-Doped Aluminosilicates
W. Moddeman	Zero Valent Nickel in Glass
J. Simmons	title unavailable

Student Poster Participants:

C. A. Capozzi	title unavailable
Kathleen Cerqua	The Role of Defect Processes in Low- T_g Chalcogenide Glasses
J. Huang	Structural Relaxation in Thin Glass Fibers
Mark Jupina	A ^{29}Si Hyperfine Study of the P_b Center and E' Center in Metal-Oxide-Semiconductor Devices
Sriraman Kannan	Excimer Laser Damage Studies on Synthetic Silica Glasses and Fibers
Jeffrey Kohli	title unavailable
Victor Levin	title unavailable
Jie Li	Draw Induced Defect/Ultraviolet Radiation Response Mechanisms in Synthetic Silica Optical Fibers
Willorage Perera	The Surface Corrosion of Glasses
Hema Senapati	Effects of Anion Mixing on Structural Relaxation and Viscosity Decoupling in $\text{AgI-Ag}_2\text{SO}_4\text{-Ag}_2\text{WO}_4$ Glasses
Cathy Shaw	Oxygen Related Defects in Barium Galliosilicate Glasses
Tom Swiler	Molecular Dynamics Fracture of Crystalline and Vitreous Silicon Dioxide
William Warren	Electron Nuclear Double Resonance and Electron Paramagnetic Resonance Study of Silicon Dangling-Bond Centers in Silicon Nitride
David Ziri	Simulations of the Structure and Properties of Sodium-Aluminosilicate Glasses

GORDON RESEARCH CONFERENCE
 BIOCATALYSIS
 PLYMOUTH STATE COLLEGE - NORTH
 JUNE 24-29, 1990

Anton, David EI Dupont De Nemours Experimental Station PO Box 80328 Wilmington, DE 19850-0328	201/203	Caruso, Andrew General Electric Corp. PO Box 8 KI 5B15 Schenectady, NY 12301	223
Arnold, Frances Caltech Chem. & Engineering 210-41 Pasadena, CA 91125	526	Chang, Ho Nam Kaist/ Dept. of Chem. Engineering PO Box 150 Seoul, Korea 130-650	703
Baresi, Larry 4800 Oak Grove Dr. MS 125-112 Pasadena, CA 91109	622	Cheung, Alex Coors Biotech 6204 South College Ave Fort Collins, CO 80525	210
Bhupathy, M. Merck & Co. Rahway, NJ 08820	317	Chmurny, A.B. WR Grace & Co./ Research Div. 7379 Route 32 Columbia, MD 21044	217
Bjorklong, Frederick Novonordisk A/S Dept. of Natural Products Novoave Bagovaero, Denmark 2880	205	Crans, Debbie Colorado State U. Dept. of Chemistry Ft. Collins, CO 80523	502
Boaz, Neil Eastman Kodak Lab/Corp. Research Lab Bldg. 82, 5th Floor Rochester, NY 14650-2110	206	Dalton, H. University of Warwick Coventry, England CV311TA	717
Bommarius, Andy Degussa AG Sect. FCO PO Box 1345 6450 Hanau West Germany	302	Dicosimo, Robert EI Dupont De Nemours Central R & D Dept. PO Box 80328 Wilmington, DE 19880-0328	218
Bratzler, Robert Sepracor Inc. 33 Locke Dr. Marlborough, MA 01752	OC	Dodds, David Sepracor Inc. 33 Locke Dr. Marlborough, MA 01752	219
Bray, Brian Glaxo Inc. 5 Moore Dr. Synthetic Organic Chem. RTP, NC 27709	208	Dordick, Jonathan University of Iowa Dept of Chemical & Biochem. Eng. 125 B Chemistry Bldg. Iowa City, IOWA 52242	303
Burgess, Kevin Rice University Chem. Box 1892 Houston, TX 77251	209	Elferink, V H M Andeno B.V. Grubbenvorsterweg 8 5928 NX Venlo, The Netherlands	220

BIOCATALYSIS
GORDON RESEARCH CONFERENCE
Plymouth State College
June 25-29, 1990

Co-Chairmen:
J.B. Jones & D.L. Anton

Co-Vice Chairmen:
J. Frost, J.D. Rozzell

Sunday, June 24 4:00-6:00 p.m. Chairmen's Reception

Monday, June 25 9:00 a.m. Chiral Synthesis

Discussion Leader: Larry Baresi

Charles Sih *Chemo-enzymatic Synthesis of Natural Products*

Keith Kyler *Chemoenzymatic Synthesis*

Manfred Schneider *Enzymic Preparation of Enantiomerically Pure Compounds*

Monday, 4:00 - 6:00 p.m. Poster Session I.

Monday, 7:30 p.m. Synthesis of Commercially Important Compounds

Discussion Leader: John Frost

Hideaki Yamada *Enzymatic Conversion of Nitriles into Useful Amides and Acids*

Hans Schoemaker *Chemo-enzymatic synthesis of enantiomerically pure amino acids and related compounds*

Tuesday, 9:00 a.m. Synthesis of Useful Compounds

Discussion Leader: Terry Lieb

Cary Morrow *Enzymatic polymerizations*

David Rozzell *Cis-muconic Acid biosynthesis*

George Whitesides *Carbohydrate Synthesis*

Tuesday 4:00 - 6:00 p.m. Poster Session I.

Tuesday 7:30 p.m. Mutagenesis

Discussion Leader: Byron Rubin

Frances Arnold *Enzyme Engineering for non-Aqueous solvents*

Jeremy Knowles *Manipulative Mutagenesis*

Wednesday 9:00 a.m.

Enzyme Models

Discussion Leader: Carl Johnson

T. Ross Kelly

Bisubstrate Reaction Templates

Fraser Stoddart

Enzyme Mimics to Molecular Self Assembly

Al Tramontano

Catalytic Antibodies

Wednesday 4:00 - 6:00 p.m.

Poster Session II.

Wednesday 7:30 p.m.

Enzyme Structural Aspects

Discussion Leader: David Anton

Arieh Warshel

Mutagenesis Calculations

Alexander Klivanov

Irreversible Enzyme Inactivation

Thursday 9:00 a.m.

Synthesis with Pathways

Discussion Leader: Bryan Jones

Greg Petsko

Mandelate Racemase, Evolution of Metabolic Pathways

Charles Goodhue

Pentaerythritol Pathway

Juan Ramos

Metabolic Pathway Engineering

Thursday 4:00 - 6:00 p.m.

Poster Session II.

Thursday 7:30 p.m.

Alkane Activation

Discussion Leader: Jonathan Dordick

Howard Dalton

Methane mono-oxygenase

John Lipscomb

Methane mono-oxygenase

Friday 9:00 a.m.

Engineering Aspects

Paul van Eikeren

Membrane-Assisted Regeneration of NAD Cofactors

Jonathan Dordick

Kinetics and Thermodynamics of Non-aqueous Enzymology

Christian Wandrey

Enzyme Reaction Engineering

**Biocatalysis Gordon Conference
Poster Session Participants**

Name	Title	Affiliation
<u>Monday-Tuesday</u>		
Fredrik Bjorkling	"Indirect Lipase Catalyzed Epoxidation"	Novo Nordisk A/S Denmark
Debbie C. Crans	"Spontaneously Formed Organic Vandates Bind Better than Organic Phosphates to Selective Enzymes: Glucose-6-Phosphate Dehydrogenase"	Colorado State Univ.
V. H. M. Elferink	"Biotechnological Production of S-2,2-dimethyl-1,3-dioxolane-4-methanol (S-DDM)"	Andeno B. V. The Netherlands
Mark W. Empie	"Biotechnological Resolution of Racemic Isopropylidene Glycerol"	International Bio-Synthetics, Inc.
Kurt Faber	"On the Catalytic Activity of Solid Enzymes in Organic Solvents"	Graz Univ. of Tech. Austria
Thomas Graycar	"The Functional Consequences of Introducing a Positive Charge in Close Proximity to the Catalytic Serine of Subtilisin"	Genencor, Int.
A. B. Hanley	1) "The Enzymic Production of 1-methoxyindolyl-3-methyl isothiocyanate - An Unstable Intermediate in Indole Glucosinolate Breakdown"	AFRC Institute of Food Research
	2) "The Intrinsic Proteolytic Activity of Ubiquitin"	
Ronald L. Hanson	"Synthesis of L- β -Hydroxyvaline by Leucine Dehydrogenase from Bacillus Species"	Bristol-Myers Squibb
David L. Hughes	"Lipase-Catalyzed Asymmetric Hydrolysis of Esters Having Remote Chiral/Prochiral Centers"	Merck, Sharp & Dohme Research Laboratories
Ronald J. Huss	"Biological Production of Phenylacetylene Cis-Dihydrodiol"	Bio-Technical Resources

Carl R. Johnson	"Immobilization of Enzymes on Azlactone Beads"	Wayne State Univ.
Jerald K. Rasmussen (to be adjacent to Carl R. Johnson)	"Azlactone-Functional Polymer Beads - A New Reactive Support for Proteins and Enzymes"	3-M Health Care
Romas J. Kazlauskas	"A Rule to Predict Which Secondary Alcohols are Efficiently Resolved by Cholesterol Esterase, Lipase from <i>Pseudomonas cepacia</i> , and Lipase from <i>Candida cylindracea</i> "	McGill University
Yu-Yen Linko H. -C. Yu	"Ester Synthesis by Various Lipases"	Helsinki University of Technology Finland

Wednesday-Thursday

Kevin Burgess	"Biocatalytic Resolutions of Sulfoxide Esters"	Rice University
Koji Kubota	"Enzymatic Synthesis of Nucleoside Analogs having Antiviral Activity"	Ajinomoto Co., Inc. Japan
Terry K. Leib	1) "Tyrosinase-catalyzed Hydroxylations of Aminoaromatic Compounds" 2) "Biological Reduction of Nitroaromatic Compounds"	General Electric Co.
David Mobley	"Aspergillus-Catalyzed Hydroxylations of Biphenyls and Terphenyls"	General Electric Co.
Monica Palcic	"Use of Glycosyltransferases for the Synthesis of Oligosaccharide Analogs"	Univ. of Alberta
Manfred Philipp	"The Catalytic Hydrolysis of Mandelonitrile"	CUNY
Sergio Riva	"Regioselective Chemo-enzymatic Acylation of Flavonoid Glycosides"	Istituto di Chimica Degli Ormoni Italy
Enzo Santaniello	"Enzymes in Organic Solvents: Enantioselective Transesterification of λ -Methyl Substituted Primary Alcohols Catalyzed by a Lipase"	Univ. of Milano Italy

Peter Seufer-Wasserthal	"Facile Preparation of Both Enantiomers of the Useful Intermediate Dimethyl Maleic Acid"	Graz Univ. of Tech.
D. Stevenson	"Enzymic Catalysis in Nitrile Chemistry"	National Research Council, Canada
Takayuki Uwajima	"Chemo-Enzymatic Synthesis of <i>l</i> -Leucovorin, an Augmentor of 5-Fluorouracil Cytotoxicity Against Cancer"	Kyowa Hakko Kogyo Co. Tokyo, Japan
Gregg Whited	"Acyltransferase: A New Enzyme for Chiral Synthesis"	Eastman Kodak Research Laboratories
Edmund Ziomek	"Aminoadipoyl Amidohydrolases: A Use of Chromogenic Cephalosporin C Analogues"	National Research Council, Canada
Milton J. Zmijewski, Jr.	"Enantioselective Acylation of a Key Chemical Intermediate in the Synthesis of Loracarbef, a New Beta-lactam Antibiotic, Using Penicillin G Amidase"	Eli Lilly and Co.

Biocatalysis Gordon Conference
Poster Session Participants

Late Additions

Name	Title	Affiliation
Monday - Tuesday		
M. Catriona Tedford	"Novel Protein-Based Catalysts"	Univ. of Strathclyde
Thomas Roetig	"Synthesis of Hydrophobic Substances in Enzyme Membrane Reactors"	Fraunhofes Institute
Wednesday - Thursday		
Ho Nam Chang	"Continuous Production of Penicillin Acylase from High Density Cell Culture"	Kaist, South Korea

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Knowles, Jeremy	611	Linko, Yu-Yen	307
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Koritalla, S.	618	Lipscomb, John	305
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		Minneapolis, MN 55455-0326	
Kurt, Faber	702	Margolin, Alexey	624
Graz University of Technology		Merrel Dow Research Institute	
Stremaygasse 16/ Inst. of Org. Chem.		9550 N. Zionville Rd.	
Graz, Austria		Indianapolis, IN 46268	
Kubota, Koji	OC	Masilamani, Divakar	625
Ajinomoto Co.		Allieg-Signal, Inc./Biotech Dept.	
Central Research		PO Box 1021R	
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Kawasaki, Japan 210			
Kyler, Keith	306	Matuszko, Anthony	626
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Ladner, Wolfgang	711	McGarrity, John	402
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		CH-3930 VISP Switzerland	
Landis, Bryan	619	Mobley, David	403
Monsanto		GE Corporate R & D	
700 Chesterfield Village Pkwy		PO Box 8, K1/CEB-455	
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Langrand, George	620	Morrow, Cary	404
State University of Utrecht		University of Mexico/Dept. of Chem.	
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Utrecht 3508 TB The Netherlands		Nakamura, Charles	405
		Dupont CR & D	
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		1-5-1 Marunouchi, Chiyoda-Ku	
		Tokyo, Japan 100	

Sauber, Klaus	418	Owajima, Takayuki	425
Hoechst AG		Tokyo Research Lab	
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6000 Frankfurt, FRG 6230		3-6-6 Asahimachi	
		Machidashi, Tokyo Japan 194	
Shutts, Bruce	OC		
Schering-Plough		Van Eikeren, Paul	309
1011 Morris Ave		Bend Research Inc.	
U-2-B		64550 Research Rd.	
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Sih, Charles	422	Wallick, Dave	426
University of Wisconsin		Dow Chemical Co.	
School of Pharmacy		Central Research	
425 N. Charter St.		1707 Bldg.	
Madison, WI 53706		Midland, MI 48674	
Stevenson, David	519	Walts, Alan	OC
Biotech Research Institute		Genzyme Corp.	
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Stoddard, Fraser	710	Wandrey, Christian	326
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		D-5170 Julich FRG	
Swanson, Paul	718	Warshel, Arie	325
Dow Chemical Co./Central Research Co.		University of Southern California	
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Midland, MI 48674		Los Angeles, CA 90089	
Tarbell, James	OC	Wedekind, Frank	323
EI Dupont De Nemours & Co. Inc		Boehringer Mannheim Corp.	
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3M Biosciences Lab, 3M Center		Bend Research Inc.	
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Tedford, Catriona	504	Whited, Gregory	322
University of Strathclyde		Eastman Kodak Co.	
Thomas Graham Bldg.		Bldg. 82B, 4th Floor	
Dept of P&A Chem, 295 Cathedral St.		Life Sciences Research Lab	
Glasgow, Scotland G1 1XL		Rochester, NY 14650-2118	
Thompson, Jeffery	304	Whitesides, George	321
EI DuPont De Nemours & Co.		Harvard University/Dept. of Chem.	
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Tramontano, Alfonso	424	Yamada, Hideaki	OC
Scripps Clinic & Research Fdn		Kyoto University/Dept of Agricultural Chem.	
Molecular Biology		Kitashirakawa-Oiwakecho Sakyo-Ku	
10666 N. Torrey Pines Rd		Kyoto, Japan 606	
La Jolla, CA 92124			

1990 GORDON RESEARCH CONFERENCE ON DIELECTRIC PHENOMENA

Final Progress Report

AFOSR Grant 89-0299

The 1990 Gordon Conference on Dielectric Phenomena was held at Holderness School, Plymouth, New Hampshire from July 22 to 27. The conference had 76 participants of which 31% were from overseas. Countries represented included Great Britain, Germany, Argentina, Hungary, Canada, Japan, Italy as well as the U.S. Conferees were a mixture of scientists from universities, industries and national laboratories. A significant fraction were first-time attendees at the Dielectric Phenomena conference.

As always in this Conference, there was a mix of scientists interested in microscopic (e.g. relaxation) and macroscopic (e.g. dielectric breakdown) phenomena in macromolecular and low molecular weight systems. The program consisted of twenty formal presentations and a poster session of fifteen papers. A significant number of papers dealt (as usual at this Conference) with relaxation in glasses; new experimental techniques were described which extended the frequencies into the gigahertz range. Liquid crystals, both high and low molar mass, were dealt with in three presentations. One session (3 papers) dealt with dielectric studies of the interaction of water with both synthetic and naturally-occurring polymers. Two papers dealt with non-linear optical phenomena including applications to processing devices. The role of polymers and non-polar liquids as dielectric insulators was covered from different points of view in four contributions.

An informal assessment concluded that the Conference was a success in terms of quality of presentation, topics covered and audience participation. At the business meeting there was a unanimous vote of approval for the Dielectric Phenomena Gordon Research Conference to be held again in the summer of 1992.

Dielectric Phenomena

Holderness School

Frank E. Karasz (Chairman)

J.T. Bendler (Vice-Chairman)

July 22-27, 1990

MONDAY A.M.

J.E. Anderson (Discussion Leader)

- | | |
|---|--|
| C. Austen Angell
(Arizona State) | "Relation Between Structure and Non-exponential Relaxation in Liquids and Glasses" |
| S. Sridhar (Northeastern University) | "Dielectric Spectroscopy at Gigahertz Frequencies in Liquids and Solids" |
| Marc L. Mansfield
(Michigan Molecular Institute) | "Dielectric Relaxations of Dilute Polymer Solutions with Application to the Poly(alkene sulfones)" |

MONDAY P.M.

John T. Bendler (Discussion Leader)

Poster Session

TUESDAY A.M.

William J. MacKnight (Discussion Leader)

- | | |
|--|--|
| F. Kremer (Max Planck Institute) | "Molecular Dynamics in Low Molar Mass and Polymeric Ferroelectric Liquid Crystals" |
| Graham Williams
(Swansea, UK) | "Molecular Dynamics and Microscopic Alignment Behaviour of Liquid Crystalline Polymers as Studied by Dielectric Relaxation Spectroscopy" |
| Armand R. Tanguay (Univ. of S. California) | "The Critical Role of Dielectric Materials in Optical Information Processing and Computing Devices" |

TUESDAY P.M.

Shiro Matsuoka (Discussion Leader)

- | | |
|--|---|
| Richard H. Boyd (Utah) | "Subglass Dielectric Relaxations in Polymers" |
| H. Block (Cranfield Inst. of Technology, UK) | "Fluid Flow, Polarization and Rheology" |

WEDNESDAY A.M.

P. Keith Watson (Discussion Leader)

- | | |
|--|--|
| Erich E. Kunhardt
(Polytechnic Univ.) | "Electron Macro Kinetics in Liquids" |
| Martin A. Abkowitz
(Xerox) | "Electronic Transport in Polymeric Insulators" |
| T. Mizutani (Nagoya
University) | "High Field Phenomena in Insulating Polymeric Films" |

WEDNESDAY P.M.

Robert L. Fulton (Discussion Leader)

- | | |
|---|---|
| P. Hedvig (Research
Inst. for Plastics,
Budapest) | "Dielectric and Mechanical Relaxation in Crosslinked
Polymers" |
| S. Havriliak (Rohm and
Haas) | "Dielectric Relaxation and Molecular Dynamics" |

THURSDAY A.M.

Gyorgy Banhegyi (Discussion Leader)

- | | |
|--|---|
| Polykarpos Pissis
(National Technical
Univ., Athens) | "Dielectric Studies of Water in Polymers and Biopolymers" |
| R. Pethig
(Bangor, UK) | "Dielectric Studies of Protein-Water Interactions and
Associated Proton Transport Processes" |
| Douglas Kell
(Aberystwyth, UK) | "Linear and Nonlinear Dielectric Properties of Biological
Materials" |

THURSDAY P.M.

J.D. Hoffman (Discussion Leader)

- | | |
|--------------------------------|--|
| David W. McCall
(Bell Labs) | "National Commission on Superconductivity" |
|--------------------------------|--|

FRIDAY A.M.

J. Pochan (Discussion Leader)

- | | |
|---------------------------------------|---|
| J. Keith Nelson
(R.P.I.) | "A Physical Basis for the Dielectric Design of Solid/Liquid
Structures" |
| James M. O'Reilly
(Kodak) | "Study of Miscible and Immiscible Polymer Blends by
Dielectric Relaxation" |
| George Stegeman (Univ.
of Arizona) | "Nonlinear Optical Phenomena in Thin Films" |

B = BREWER
C = COTTAGE
HAM = HAMMOND
H = HOIT
K = KELSER
L = LIVERMORE
LO = LOOKWOOD

GORDON RESEARCH CONFERENCES
HOLDERNESS SCHOOL, PLYMOUTH, N.H.
DIELECTRIC PHENOMENA
JULY 23-27, 1990

M = MARSHALL
N = NILES
NO = NOURSE
O = OFF CAMPUS
R = RATHBUN
S = SARGENT
W = WEBSTER

Abkowitz, Martin Xerox Corp. 800 Phillips Road Webster, NY 14580	B4	Bendler, John GE R&D Center K1, Room 4BM Schenectady, NY 12301	H4
Allison, John Microwaves Research Group Dept. Physics, Kings College London, WC2 UK	N27	Berberian, John Saint Joseph's Univ. Chemistry Dept 5600 City Line Ave Philadelphia, PA 19131	H21
Anderson, James Ford Motor Company Scientific Research P.O. Box 2053 Drop 3083 Dearborn, MI 48121-2053	N6	Block, H. Cranfield Inst. of Tech. School of Industrial Science Centre for Molecular Electronics Cranfield, Bedford MK43 01K England	N24
Angell, C.A. Arizona State Univ., Chemistry Tempe, AZ 85287	N21	Boyd, Richard Univ. of Utah Science Dept. 304 EMRU Salt Lake City, UT 84124	Lo4
Arenbeck, Helmut Papierfabrik Oberschmitt GMBH Rhoenstr. 13 06478 Nidda, Hessen 6478 West Germany	H1	Carlini, Carlo Univ. of Bologna Dipt Di Chimica Ind Le E Dei Materiali Viale Risorgimento 4 Bologna 40136 Italy	N5
Avakian, Peter Dupont Company CRD, Experimental Station P.O. Box 80356 Wilmington, DE 19880-0356	B3	Cole, Robert Brown Univ. Chemistry Dept., Box H Providence, RI 02912	R10
Banhegyi, Gyorgy Bio-Pharm Research & Development Ltd. Konyves Kalamn KRT. 76 H-1087 Budapest, Hungary	N6	Connolly, Michael PL Thermal Sciences, Inc. 160 Old Farm Road Amherst, MA 01002	R29
Baron, Maximo Facultad De Ciencias Exactas Y Naturales Pabellon 1 - C Universitaria Buenos Aires 1428 Argentina	C4	Dissado, Leonard Kings College Dept. of Physics Strand London WC2R 2LC England	N4
Beatty, C.L. 101 Rhines Hall Dept. of Mat. Sci. & Eng. Univ. of Fl. Gainesville, FL 32611	N1	Fulton, Robert Florida State Univ. Dept. of Chemistry Tallahassee, FL 32306-3006	R8

Graybeal, Jack Virginia Tech. Dept. of Chemistry Davidson Hall Blacksburg, VA 24061-0212	R9	Jonscher, Andrew Royal Holloway College Physics Dept. Egham Hill Egham, Surrey TW20 OEX England	N23
Gerschel, Alain Universite Paris Sud Chimie Physique Bat 490 91405 Orsay France	O	Kalnin, I.L. Hoechst-Celanese Co. Research Division 86 Morris Ave Summit, NJ 07901	Ham3
Hager, Nathaniel III Armstrong World Industries Research & Development Lancaster, PA 17604	H8	Karasz, Frank Univ. of Massachusetts Polymer Science & Engineering GRC 701 Amherst, MA 01003	Ham5
Havriliak, Stephen Rohm & Haas Co. Bristol Research Labs P.O. Box 219 Bristol, PA 17007	B2	Kell, Douglas Univ. College of Wales Dept. of Biological Science Aberystwyth Dyfed, Wales SY233DA United Kingdom	N2
Hedvig, Peter Plastics Research Institute Budapest XIV Hungaria KRT 114 Dept. Radiation Chemistry Budapest 1950 Hungary	N1	Kennedy, Alvin Dow Chemical Co. Bldg. 1712 Midland, MI 48674	R1
Hoffman, Drew Stanford Univ. Chemical Engineering Dept. Stanford, CA 94305	M8	Kremer, F. Max Planck Institut F. Polymerforschung Postfach 3148 Mainz 6500 FRG	M6
Hoffman, John Michigan Molecular Inst. 1910 W. St. Andrews Rd. Midland, MI 48640	Lol	Kunhardt, Erich Polytechnic University Weber Research Institute Route 110 Farmingdale, NY 11735	H7
Ichikawa, Kimio Univ of Massachusetts c/o Dr. MacKnight, Room 701, PSE, LGRC Amherst, MA 01003	M7	MacKnight, William Univ. Of Mass. Amherst, MA 01003	R30
Johnson, Edward AT&T Bell Labs Room 70-214 600 Mountain Ave. Murray Hill, NJ 07974	H3	Mansfield, Marc Michigan Molecular Institute 1910 West St. Andrews Midland, MI 48640	M1
Jones, Marvin 3M 3M Center Bldg. 260-3-02 St. Paul, MN 55144	O	Marand, Eva Virginia Polytechnic Inst. Chemistry Dept. Blacksburg, VA 24060	B1

Mason, James Atochem North America 900 First Ave King of Prussia, PA 19406	N25	O'Reilly, James Eastman Kodak Co Corporate Research Lab Bldg 82-64DD Rochester, NY 14650-2110	H2
Matsuoka, S. AT&T Bell Labs Room 7F202 Murray Hill, NJ 07974	R26	Pethig, Ronald University of Wales School of Electronics Dean Street Bangor, GWYNNEDD LL57 1UT United Kingdom	M3
McCall, David AT&T Bell Labs Room 1A-263 600 Mountain Ave. Murray Hill, NJ 07974	Nol-2	Pfeiffer, Matthias Technische Hochschule Physikalische Chemie I Petersenstrasse 20 Darmstadt 6100 FRG	H28
Mizutani, Teruyoshi Nagoya Univ. Dept. of Elect. Engineering Furo Cho, Chikusa Nagayo 464-01 Japan	K1	Pissis, P. National Tech Univ of Athens Dept. of Physics Zografou Campus GR 15773 Athens Greece	H5
Mopsik, Frederick Natl Inst of Standards & Technology Polymers Division, B320, Bldg. 224 Gaithersburg, MD 20899	Ham4	Pochan, John Eastman Kodak Bldg 82 604B Rochester, NY 14650	R2
Nachlis, Warren GE CR & O P.O. Box 8, K-1 4B22 Schenectady, NY 12301	M2	Richards, Mark Microwave Research Group Physics Dept, King's College Stand, London WC2R 2LS U.K.	
Neill, John Dept of Polymer Science & Engineering Univ. of Massachusetts Amherst, MA 01003	R29	Rolla, Pierangelo University of Pisa Departimento Di Fisica Piazza Torricelli 2 Pisa 56100 Italy	N5
Nelson, Keith Rensselaer Polytechnic Inst Dept. of Electric Power Eng 110 8th Street Troy, NY 12180-3570	H7	Sarjeant, W.J. SUNY/ AB Dept. of Elec. Engineering Bonner Hall, Room 312, North Campus Buffalo, NY 14260	N26
Nettelblad, Bo ABB Corporate Research S-72118 Vasteas Sweden	H6	Sedita, Joseph Eastman Kodak Co. Corporate Research Labs Bldg. 82, Room 6400 Rochester, NY 14650-2110	H5
Nozaki, Ryusuke Universite Du Quebec A Trois Rivières Dept. De Physique, C.P. 500 Trois Rivières, Quebec G9A 5H7 Canada	R7		
O'Dwyer, J.J SUNY at Oswego Physice Dept. Oswego, NY 13126	H2		

Shlesinger, Michael 412 Green Pasture Dr. Rockville, MD 20852	R21	Wei, Yanzhen Northeastern Univ. Physics Dept. 360 Huntington Ave Boston, MA 02115	Ham6
Sridhar, S. Northeastern Univ. Physics Dept. 360 Huntington Ave. Boston, MA 02115		Wempe, Lawrence Atochem N.A. 900 First Ave. P.O. Box 1536 King of Prussia, PA 19406	H22
St. Clair, Anne Nasa Langley Research Center Mail Stop 227 Hampton, VA 23665	Ham1	Willand, Craig Eastman Kodak Company Kodak Park Mail Stop 02021 Rochester, NY 14650	M4
Starkweather E. I. Du Pont De Nemours & Co., INC Central Research & Devel. Dept. Experimental Station, Bldg. 356 Wilmington, DE 19880-0356	N4	Williams, Graham Univ. College of Swansea Chemistry Dept. Singleton Park Swansea SA2 8PP England	H27
Stegeman, George Univ. of Arizona Optical Sciences Center Tucson, AZ 85721	R3	Yagihara, Shin Tokai University Junior College 2-3-23 Takanawa Minato-Ku Tokyo 108 Japan	K4
Stoakley, Diane Nasa Langley Research Center Mail Stop 227 Hampton, VA 23665	Ham1	Yang, Arthur Armstrong World Industries, Inc R&D P.O. Box 3511 Lancaster, PA 17604	H23
Tajitsu, Yoshiro Waseda Univ. Honjyo Senior High School 1136 Okuboyama Nishiomita Honjyo Saitama 367 Japan	K2	Zheng, Qing Arizona State Univ. Dept. of Chemistry Tempe, AZ 85287	R28
Tanguay, Armand Jr. 520 Seaver Science Center Univ. of Southern California Univ. Park, MC-0483 Los Angeles, CA 90089-0483	C2		
Teraoka, Iwao IBM Almaden Research Center K931/801 650 Harry Road San Jose, CA 95139	K3		
Watson, P. Keith Xerox Corporation Webster Research Center 800 Phillips Road, 0114-24D Webster, NY 14580	C1		

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THE CHAIRMAN'S REPORT ON THE GORDON CONFERENCE

ON PHYSICAL ELECTROCHEMISTRY

JULY 29 - AUGUST 3, 1990

COLBY JUNIOR COLLEGE

NEW LONDON, NEW HAMPSHIRE

The meeting was divided into five sections: the first was on the structure of the interfacial region, (Dr. David Schiffrin from the University of Southampton chaired this session.)

The second section was on experimental approaches to quantum aspects of the double layer. This section was chaired by Professor Joseph Hupp from Northwestern University. The session on nuclear electrochemistry, an unusual topic, was chaired by Dr. Fritz Will, and that on new experimental methods by William O'Grady. Finally, the bioelectrochemistry section on the Friday morning was chaired by Professor Adam Heller from the University of Texas.

All these sections had their outstanding moments and a few of these may be related. Dr. McLaughlin, for example, speaking on the structure of interfaces, made clear that he thought that the Gouy-Chapman relationship was still true, even though it was not applicable to double layers at the metal-solution interface or the semiconductor interface. He managed to apply it by moving the fiducial plane out into the solution.

Dr. Heeger at the University of California was electrifying in the evening when he told us about the progress that had been made with electronically conducting polymers and made clear that he thought it likely that the polymers would exceed metals and their conductivity. It was a matter of the length of the segment in which the electron was allowed to flow. If the segment was long enough then eventually the conductance of a fiber could rise to about 5 orders of magnitude greater than that of a metal! This would make hot superconductivity unnecessary.

The new field of nuclear electrochemistry was, of course, as usual, one of great controversy but the encouraging thing was that the Chairman had just returned from a trip to Japan where he had got to talk to some of the 50 Japanese groups, amounting to 1000 workers who are now researching cold fusion in that country. Dr. Will reported the neutron bursts about one million per second (10^5 greater than observed here) and he told us of the formation of tritium by some of these groups.

Then, on the Thursday, the most impressive paper turned out to be that in the evening by Dr. Bruce Schardt. The Chairman described it as a tour de force because of the vigorous way in which Dr. Schardt described the best way to obtain good pictures at atomic resolution.

On the Friday morning the most outstanding paper was that given by Dr. Hill, - who has recently been appointed a Fellow of the Royal Society, - who told us of his researches in electron transfer kinetics to substances of biological origin.

The Gordon Conference in Physical Electrochemistry of 1990 was said by some to be the most outstanding of the three conferences which have been held so far and it is hoped that the new Chairman, Professor Hector Abruna from the Cornell University, will be joined by the freshly elected Vice Chairman, Dr. William O'Grady, of the Naval Research Laboratory in Washington, for the 1992 Conference.

Sam O'Grady
Aug 6, 1990

*Chairman's Final Progress Report***1990 Gordon Research Conference on Organometallic Chemistry**

Air Force Office of Scientific Research Contract No. 90-NC-047

The 1990 Gordon Research Conference on Organometallic Chemistry was held from June 24 - 29, 1990 at Salve Regina College in Newport, R. I. A total of 134 participants was selected from approximately 150 applications. Attendance was well divided between academic (88), industrial (43) and national laboratory (3) participants. Thirteen participants were from countries outside the United States, and 12 were women. A copy of the participants list is attached.

Based on its success in last year's program, the conference retained the policy of scheduling a relatively large number of short (30-minute) invited talks combined with substantial amount of time for discussion following each presentation. This format minimized the tendency of speakers to rehash published work and (as the Gordon Conference administration suggests) encourages them to focus on their most important and timely results. In addition, 57 participants chose to present recent research results in poster form. Because of the large number of posters a full poster session was arranged for each evening of the conference except Sunday. These sessions were held in the informal discussion area, which has been equipped by Salve Regina college with air conditioning, tables, excellent lighting, and a refreshment facility. Because of the quality of the contributions and facilities, the posters attracted a great deal of attention and generated much lively discussion during the conference.

Another successful policy continued from last year was the six speaking slots open until the first evening of the meeting. At that time, the best poster submissions were selected by a committee appointed by the chairman, and the authors of these posters were invited to give talks rather than poster presentations in the open time slots. One change from last year was that these "poster talks" were distributed throughout the five days of the meeting, rather than being concentrated on Friday morning. This procedure was again very successful; some of the most exciting and timely discoveries presented at the meeting appeared in these last-minute selections. Including the poster talks, 32 oral presentations were made at the meeting. A copy of the complete program is enclosed with this report.

Individuals were invited to the conference in three categories: invited speakers, session chairs, and members of the committee to select the six poster talks. Because almost all the invitations were accepted, this resulted in attendance by many of the most important scientists in organometallic chemistry and allied fields. In assembling the speaker list we worked to maintain a balance of mainstream topics (e.g., transition metal and main group organometallic synthesis and reaction mechanisms; homogeneous catalysis; applications to organic synthesis) with new areas in which organometallic chemistry is currently or potentially having a significant impact (synthesis of new materials such as thin films and polymers, interfacial phenomena, surface science, new physical techniques).

Judging from informal comments of participants, the best talks at the meeting came from both mainstream organometallic and interdisciplinary areas. Highlights of the meeting were John Ellis and John Cooper's presentations on the preparation of novel new anionic "negative oxidation state" organometallic complexes, Robert Miller's talk on the chemistry of polysilanes, the lecture by Tobin Marks on the use of lanthanide complexes as catalysts useful in organic synthesis, Eric Jacobsen's poster talk on a dramatic new method for catalytic asymmetric epoxidation of unfunctionalized alkenes, Morris Bullock's poster talk

4.

on radical intermediates involved in the reactions of metal hydrides with alkenes, Sylvia Ceyer's presentation on the mechanism of methane activation on metal surfaces, and Bradford Wayland's lecture on C-H bond reactions of porphyrin complexes. Two invited speakers also received important awards just before the meeting--Harry Gray received the Priestly medal of the American Chemical Society, and Susan Thomas was awarded the Meldola medal of the Royal Society of Chemistry. We were especially gratified that Dr. Gray was able to participate. In true Gordon Conference tradition, he arrived Saturday evening, spent the entire week at the meeting, and gave an excellent talk Thursday evening on platinum photochemistry and photocatalysis. Gray's enthusiasm was mirrored by the high degree interaction of the other participants.

To provide an indication of the quality of the conference, as well as the sort of interaction stimulated among the attendees, attached to this report are copies of letters received by the chairman from several of the participants in early July. Although we have not yet received the formal questionnaires filled out at the meeting, it seems clear from these letters and other comments made to the organizers that the 1990 Gordon Conference on Organometallic Chemistry was exceptionally successful.

Attachments

GORDON CONFERENCE ON ORGANOMETALLIC CHEMISTRY

Salve Regina College, Newport, R. I.

June 24 -29, 1990

Chair: Robert G. Bergman; Vice Chair: Alfred P. Sattelberger

Poster talk selection committee: Maurice Brookhart, Henry E. Bryndza, Nancy M. Doherty, John A. Gladysz, Jack R. Norton, Peter T. Wolczanski

Monday, June 25

Session 1: Exploratory Organometallic Synthesis, Reactivity, and Mechanisms

Chair: Denis Forster (Monsanto Company)

Heinz Berke (University of Zurich)

"How to Make Transition Metal Hydrogen Bonds More Reactive: A Conceptual Approach and Its Experimental Consequences"

Thomas C. Flood (University of Southern California)

"Mechanisms of Bond Activations by Soluble Complexes of Iridium and Osmium"

John E. Ellis (University of Minnesota)

"New Synthetic Routes to Highly Reduced Organometallics"

Two papers selected from poster submissions

Session 2: Applications to Organic Synthesis and/or Chiral Organometallic Chemistry

Chair: Richard J. Piccolini (Rohm and Haas Company)

Yoshihiko Ito (Kyoto University)

"Asymmetric Aldol Reactions of α -Isocyanocarboxylates and Related Isocyanate Derivatives Catalyzed by Chiral IB Metal Complexes"

N. John Cooper (University of Pittsburgh)

"The Application of Diastereomeric Tungstenocene Complexes Containing Chiral Metal Centers to the Study of Organometallic Reactions"

S.E. Thomas (University of Warwick)

"Reactivity of Heterodiene Metal Carbonyl Complexes"

Tuesday, June 26

Session 3: Main Group Organometallic Chemistry

Chair: John E. Bercaw (California Institute of Technology)

Dr. Peter Jutzi (University of Bielefeld)

" π -Complexation in Main-Group-Chemistry - Some Recent Results"

Lawrence R. Sita (Carnegie Mellon University)

"New Chemistry of Polycyclic Organostannanes"

Gerard Parkin (Columbia University)

"Poly(pyrazolyl)hydroborato Alkyl Derivatives of the *s*- and *p*-block Metals"

Two papers selected from poster submissions

Session 4: Organometallic Sulfur Chemistry

Chair: Eric R. Evitt (Catalytica Associates, Inc.)

Thomas B. Rauchfuss (University of Illinois at Urbana-Champaign)

"Studies on Organoruthenium and Organorhodium Sulfides"

Robert J. Angelici (Iowa State University)

"Reactions of Thiophene in Organometallic Complexes"

E.J.M. de Boer (Koninklijke/Shell-Laboratorium)

"Reactions of Rhenium Oxides with Alkynes"

Wednesday, June 27

Session 5: Materials, Solid State, Polymers

Chair: John P. Fackler Jr. (Texas A&M University)

Herbert D. Kaesz (University of California, Los Angeles)

"Deposition of Transition Metal Thin Films from Organometallic Precursors"

R.D. Miller (IBM)

"Soluble High Molecular Weight Polysilanes: Science and Applications"

Ralph G. Nuzzo (AT&T)

"The Molecular Self-Assembly of Organic Thiols on Au(111) and the Application of These Materials in Condensed Phase Studies"

One paper selected from poster submissions

Session 6: Lanthanides, Actinides, etc.

Chair: B. Duane Dornbeck (Union Carbide Corporation)

Tobin J. Marks (Northwestern University)

"New Homogeneous Catalysis with Organo-Lanthanides"

James C. Stevens (Dow Chemical Company)

"Selective Propylene Dimerization Catalyzed by Organouranium Compounds"

F. G. N. Cloke (University of Sussex)
"High and Low Oxidation State Organo-f-element Compounds Derived from Bulky Aromatic Ligands"

Thursday, June 28

Session 7: Techniques, Theory

Chair: Cynthia M. Friend (Harvard University)

John D. Simon (University of Colorado)
"Picosecond Studies of the Photodissociation of Chromium Hexacarbonyl"

Sylvia T. Ceyer (Massachusetts Institute of Technology)
"The Activation of CH₄ and the Synthesis of C₆H₆ from CH₄ on Ni(III)"

Charles M. Lieber (Columbia University)
"Scanning Tunneling Microscopy Studies of the Structural and Electronic Effects of Metal Substitution in Inorganic Materials"

One paper selected from poster submissions

Session 8: Inspirations

Chair: Malcolm L.H. Green (University of Oxford)

John A. Osborn (University of Strasbourg)
"Catalysts for the Chemo- and Enantio- Selective Reduction of Imines"

Harry B. Gray (California Institute of Technology)
"Binuclear Iridium and Platinum Photochemistry and Photocatalysis"

Friday, June 29

Session 9: Methane, Alkane Chemistry

Chair: Patricia L. Watson (E.I. duPont de Nemours)

Bradford B. Wayland (University of Pennsylvania)
"C-H Bond Reactions of Rh(II) and Ir(II) Porphyrin Complexes"

D. Michael Heinekey (Yale University)
"Reactions of Methane with Rhenium Complexes"

Jay A. Labinger (California Institute of Technology)
"Practical Approaches to Alkane Activation: From Methane Mono-Oxygenase to Organometallic"

Wrap-up session

Gordon Conference on Organometallic Chemistry - 1990

Schedule

<u>Mon AM</u>	<u>Tues AM</u>	<u>Wed AM</u>	<u>Thurs AM</u>	<u>Fri AM</u>
8:45 Chann's Intro	9:00 Tutzi	9:00 Kaesz	9:00 Simon	9:00 Wayland
9:00 Berke	9:30 Disc	9:30 Disc	9:30 Disc	9:30 Disc
9:30 Disc	9:40 Sita	9:40 Miller	9:40 Ceyen	9:40 Heinekey
9:40 Flood	10:10 Disc	10:10 Disc	10:10 Disc	10:10 Disc
10:10 Disc	10:20 Break	10:20 Break	10:20 Break	10:20 Break
10:20 Break	10:35 Parkin	10:35 Nu330	10:35 Lieber	10:35 Labinger
10:35 Ellis	11:05 Disc	11:05 Disc	11:05 Disc	11:05 Disc
11:05 Disc	11:15 Poster Talk	11:15 Poster Talk	11:15 Poster Talk	11:15 Wrap-Up
11:15 Poster Talk	11:35 Disc	11:35 Disc	11:35 Disc	
11:35 Disc				

<u>Mon AM</u>	<u>Tues PM</u>	<u>Wed PM</u>	<u>Thurs PM</u>
7:30 Ito	7:30 Ranchfuss	7:30 Marks	7:30 Osborn
8:00 Disc	8:00 Disc	8:00 Disc	8:00 Disc
8:10 Cooper	8:10 Angelici	8:10 Stevens	8:15 Gray
8:40 Disc	8:40 Disc	8:40 Disc	8:45 Disc
8:50 Thomas	8:50 de Boer	8:50 C/oke	9:00 Bus Mtg
9:20 Disc	9:20 Disc	9:20 Disc	

1990 Organometallic Gordon Research Conference Poster Schedule

Chair: Robert G. Bergman

Vice-Chair: Alfred P. Sattelberger

Session 1 - Monday, June 25

1. "Metal-Catalyzed Oxidation of Para-Substituted Phenolics. Approaches to Benzoquinones"
Joseph J. Bozell
Chemical Conversion Research Branch
Solar Energy Research Institute
2. "Synthesis, Structure and Reactivity of Metallabenzenes"
John R. Bleake
Department of Chemistry
Washington University
3. "Some Applications of Diolate-Derived Chiral Auxiliaries in Organo-Transition Metal Chemistry"
Joseph A. Heppert
Department of Chemistry
University of Kansas
4. "The Binding of Heteroaromatic Nitrogen Compounds with $\text{Cp}^*\text{Rh}^{2+}$, CpRu^+ , and Cp^*Ru^+ Complexes and the Role of η^1 , N-Bonded Complexes in the Regioselective Hydrogenation of the Nitrogen Ring"
Richard Fish
Department of Chemistry
Lawrence Berkeley Laboratory
5. "A New Carbon-Hydrogen Bond Activation Reaction: 'Vinylic' Deprotonation of Cationic Rhenium Alkene Complexes"
John A. Gladysz
Department of Chemistry
University of Utah
6. "Unprecedented Reactions Between Transition Metal Alkynyl Complexes and Nucleophiles: Synthesis and Crystal Structures of $\text{Fe}_2(\text{CO})(\mu\text{-CO})\{\mu\text{-}\sigma\text{-}\eta^3\text{-C(O)C(R)-C[C(O)R']}\}(\eta^5\text{-C}_5\text{H}_5)(\eta^5\text{-C}_5\text{R}''_5)$ ($\text{R} = \text{CH}_3$, $\text{C}\equiv\text{CSiMe}_3$; $\text{R}' = n\text{-Bu}$, CH_3 , C_6H_5 ; $\text{R}'' = \text{H}$, CH_3)"
Andrew Wong
Department of Chemistry
Occidental College

7. "Photooxidation of Metal Carbynes: Metal Radical Reactivity Versus Rearrangement of the Carbyne Ligands in the 17-Electron Intermediates"
Lisa McElwee-White
Department of Chemistry
Stanford University
8. "Quantum Mechanical Exchange of Hydrides in Solution. Proton-Proton Exchange Couplings and Rotational Tunneling in Transition Metal Polyhydrides"
Kurt W. Zilm
Department of Chemistry
Yale University
9. "Metal Alkyl Versus Metal Vinyl Insertion Reactions"
Kenneth M. Doxsee
Department of Chemistry
University of Oregon
10. "Catalytic Hydroboration: The Study of a Model Iridium System"
Joseph S. Merola
Department of Chemistry
Virginia Polytechnic Institute and State University
11. "Transformations of Organo-Iridium Phosphide Complexes"
Michael D. Fryzuk
Department of Chemistry
University of British Columbia
12. "Synthesis, Structure and Reactivity of the Encapsulated Metallocenes $[(i\text{-Pr})_4\text{C}_5\text{H}]_2\text{Ca}$ and $[(i\text{-Pr})_4\text{C}_5\text{H}]_2\text{Ba}$ "
Timothy P. Hanusa
Department of Chemistry
Vanderbilt University
13. "Oxygen Containing Metallacycles From Ruthenium Enolates"
Robert G. Bergman
Department of Chemistry
University of California, Berkeley
14. "Formation of 2,3-Butanedione in the Carbonylation of a Binuclear Rhodium Methyl Complex Under Extremely Mild Conditions"
Richard Eisenberg
Department of Chemistry
University of Rochester
15. "Carbon-Oxygen Bond Activation. The Deoxygenation of Phenols by Oxygen Atom Transfer to CO"
Clifford P. Kubiak
Department of Chemistry
Purdue University

16. "Mass Spectroscopic Studies of Large Gold Clusters"

John P. Fackler
Department of Chemistry
Texas A&M University

Session 2 - Tuesday, June, 26

17. "Asymmetric Synthesis and Applications of C₂-Symmetrical Chiral Cyclopentadienyl Metal Complexes"

Ronald L. Halterman
Department of Chemistry
Boston University

18. "Characterization of the Cationic Radicals {H₃Ru₃[CX](CO)_{9-n}L_n}⁺, where X = OMe, SEt or NMe₂; L = PPh₃, AsPh₃; n = 2 or 3"

Jerome B. Keister
Department of Chemistry
SUNY Buffalo

19. "Mechanism of Alkyl Migration in Iron-Manganese Alkoxy-Carbene Decomposition"

William H. Hersch
CUNY Queens College

20. "The First Electron-Transfer Catalyzed Ligand Substitution Which is Faster for an Even- Versus the Parent Odd-Electron System"

Rinaldo Poli
Department of Chemistry
University of Maryland

21. "Rhodium-Catalyzed C-H Bond Functionalization. I. Thermal Aldehyde Decarbonylation (and Alkene Carbonylation?) II. Insertion of Acetylenes in Benzene C-H Bonds."

Alan S. Goldman
Department of Chemistry
Rutgers University

22. "Air-Sensitive Procatalysts for Ring-Opening Metathesis Polymerization of Norbornene-Type Monomers"

Larry F. Rhodes
Research and Development Center
BF Goodrich Company

23. "Synthesis of Tungsten Oxo and Alkylidene Complexes Using Organosilicon Reagents"

James M. Mayer
Department of Chemistry
University of Washington

24. "Structure and Reactivity of Bimetallic Fischer Carbene Complexes"
M. G. Finn
Department of Chemistry
University of Virginia
25. "Hydrogen Atom Transfer Reactions of Transition Metal Hydrides. Kinetics and Mechanism of the Hydrogenation of α -Cyclopropyl Styrene"
R. Morris Bullock
Department of Chemistry
Brookhaven National Laboratory
26. "Evidence for an α -Agostic Transition State for Olefin Insertion"
John E. Bercaw
Division of Chemistry and Chemical Engineering
California Institute of Technology
27. "Bimetallic Hydroformylation: A Dramatic Example of Homobimetallic Cooperativity"
George G. Stanley
Department of Chemistry
Louisiana State University
28. "Cleavage of Dialkylsiloxanes by Trimethylaluminum"
Andrew R. Barron
Department of Chemistry
Harvard University
29. "Transition Metal S₂O Complexes and Transition Metal-Mediated Thiosulfinate Ester Synthesis"
Mark E. Welker
Department of Chemistry
Wake Forest University
30. "C-S Bond Cleavage by Rhodium: A Homogeneous Model for Mechanistic Studies of the Hydrodesulfurization (HDS) Reaction"
William D. Jones
Department of Chemistry
University of Rochester
31. "Reactions of Mo/Co/S Clusters Relevant to HDS Catalysis"
M. David Curtis
Department of Chemistry
The University of Michigan
32. "Reactions of 1-Sila-3-Metallacyclobutane Complexes of Zirconium"
Jeffrey L. Petersen
Department of Chemistry
University of West Virginia

Session 3 - Wednesday, June 27

33. "C-C Bond Cleavage Reactions in Platinum Glycolate Complexes"
Mark Andrews
Department of Chemistry
Brookhaven National Laboratory
34. "E-H Activation Chemistry: Marked Differences in Ir-H Reactivity in Complexes Resulting From S-H, C-H, N-H and O-H Oxidative Addition to Iridium"
Joseph S. Merola
Department of Chemistry
Virginia Polytechnic Institute and State University
35. "Simple Molybdenum and Tungsten Carbyne Complexes"
Joseph L. Templeton
Department of Chemistry
University of North Carolina
36. "Alkylation of Highly Reduced Rhenium Oxo Complexes $[\text{Re}(\text{O})(\text{RC}\equiv\text{CR})_2]\text{Na}$: Evidence for Radical and $\text{S}_{\text{N}}2$ Pathways"
James M. Mayer
Department of Chemistry
University of Washington
37. "Molecular Analogs of Multiple Quantum Wells?"
Paul J. Fagan
Central Research and Development Department
E. I. DuPont de Nemours and Company
38. "Chemical Vapor Deposition of Gold"
Fred McCormick
Corporate Research
3M
39. "Molecular Precursors for Iridium Phosphide and the Synthesis of Small Semiconductor Clusters in Solution"
Klaus H. Theopold
Department of Chemistry
Cornell University
40. "Organometallic Complexes with Sterically Distressed Ligands: The 1,2,3-tri-*t*-butylcyclopentadienyl Ligand"
Russell P. Hughes
Department of Chemistry
Dartmouth University
41. "The Ladder Structure of $[\text{Bu}^t\text{CH}_2)_2\text{TaN}]_5 \cdot \text{NH}_3 \cdot \text{C}_7\text{H}_8$ and its Relationship to Cubic Tantalum Nitride"
Peter T. Wolczanski

Department of Chemistry
Cornell University

42. "Surface Organometallic Chemistry"

Jeffrey Schwartz
Department of Chemistry
Princeton University

43. " $\text{Cp}^*_2\text{V}_2\text{Br}_4$ - A New Synthon in Mid-Valent Vanadium Chemistry. Preparation of
of $\text{Cp}^*_2\text{V}_2(\text{CH}_3)_4$, a Complex with Four Bridging Methyl Groups"

Louis Messerle
Department of Chemistry
University of Iowa

44. "Cobalt Half-Sandwich Complexes with Intramolecular C-C Double Bond
Coordination"

Jun Okuda
Anorganisch-Chemisches Institut
Technische Universität München

45. "Kinetics and Mechanism of Electron-Transfer from Pentacarbonylrhenate to Metal
Carbonyl Dimers"

Jim D. Atwood
Department of Chemistry
SUNY Buffalo

46. "Acyclic Diene Metathesis Polymerization Chemistry"

James M. Boncella
Department of Chemistry
University of Florida

Session 4 - Thursday, June 28

47. "A Puzzle in Para-Hydrogen-Induced Polarization. Signal Enhancement in
Asymmetric Hydrogenation by Addition of a Second Substrate"

Richard Eisenberg
Department of Chemistry
University of Rochester

48. "Hydrogen Bonding Properties of Transition Metal Fluorides"

Thomas Richmond
Department of Chemistry
University of Utah

49. "Metal Tellurates: Synthesis, Structure and Reactivity"

John Arnold
Department of Chemistry
University of California, Berkeley

50. "Interaction of Aldehydes with Monomeric Aluminum Complexes"
Andrew Barron
Department of Chemistry
Harvard University
51. "Unsaturated Mixed-Metal Complexes: Synthesis, Structures and Reactivity"
Michael J. Chetcuti
Department of Chemistry
University of Notre Dame
52. "Rearrangement and C-X Bond Formation Using Nickel Complexes"
Allan R. Pinhas
Department of Chemistry
University of Cincinnati
53. "Electrocyclic Reactions of $(C_5H_5)Fe(pentadienoyl)$ Complexes"
Neil T. Allison
Department of Chemistry
University of Arkansas
54. "IR Analysis of Anion Metathesis. Lability of Low Valent d^6 Complexes"
Norris W. Hoffman
Department of Chemistry
University of South Alabama
55. "Reaction of Cyclopropylcarbene-Tungsten Complexes with Alkynes: A New Seven-Membered Ring Synthesis"
James W. Herndon
Department of Chemistry
University of Maryland
56. "Structural Data from Solid -State Deuterium NMR Spectroscopy"
Leslie Butler
Department of Chemistry
Louisiana State University
57. "Neutral Dihydrogen Complexes of Iridium"
Craig Jensen
Department of Chemistry
University of Hawaii

GORDON RESEARCH CONFERENCES

ORGANOMETALLIC CHEMISTRY

June 25-29, 1990
Salve Regina College, Newport, RI

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DR. NANCY M. DOHERTY
DEPARTMENT OF CHEMISTRY

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Monday, July 30, 1990

Professor Robert G. Bergman
Department of Chemistry
University of California, Berkeley
Berkeley, CA 94720

Dear Bob:

The purpose of this note is to congratulate you on the success of this year's Organometallic Chemistry Gordon Conference and to thank you for putting together such a fine program. I greatly appreciate having had the opportunity to participate.

Sincerely,

A handwritten signature in cursive script, appearing to read "Nancy".

Nancy M. Doherty
Associate Professor of Chemistry

HARVARD UNIVERSITY
DEPARTMENT OF CHEMISTRY

*12 Oxford Street
Cambridge, Massachusetts 02138
U.S.A.*

July 9, 1990

Professor Robert G. Bergman
University of California/Berkeley
Department of Chemistry
Berkeley, CA 94720

Dear Bob:

Many thanks for organizing a great Conference! It was good seeing you, and I thank you for all your work (including making arrangements for last-minute attendees). I found the meeting truly stimulating, and appreciate the opportunity to participate.

When you have a chance, I'd appreciate your hunting up and sending those papers on oxymetalloacycles you told me about.

Best regards,



Cynthia M. Friend
Professor of Chemistry



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Tuesday, July 3, 1990

Professor Robert G. Bergman
Department of Chemistry
University of California — Berkeley
Berkeley, CA 94720

Dear Bob:

Enclosed is a preprint of our paper on hydrogen atom transfer reactions that you asked about.

I enjoyed seeing you at the Gordon Conference. I found the meeting to be very stimulating, and I thank you for all of your efforts as chairman of the conference.

Best regards.

Sincerely,

A handwritten signature in cursive script that reads 'Morris'.

R. Morris Bullock

July 12, 1990

Professor Robert G. Bergman
Department of Chemistry
University of California
Berkeley, California 94720

Dear Bob,

Thank you for sending me a copy of your manuscript for the Journal of Organometallic Chemistry. It presents a nice, personal overview of your route into the C-H activation work. I found only one item that you may want to check on page 4, line 10. I believe that Rausch's compound was $\text{CpIr}(\text{CO})_2$, not $\text{Cp}^*\text{Ir}(\text{CO})_2$. Otherwise, the paper looks fine.

Let me also take this opportunity to congratulate you on doing a fine job with the Gordon Conference. Everything went very smoothly, and I thought that the program was a huge success. See you soon.

Sincerely,



William D. Jones
Professor of Chemistry

WDJ/acb

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Shell Distinguished Professor

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July 11, 1990

Professor Robert G. Bergman
Department of Chemistry
University of California, Berkeley
Berkeley, California 94720

Dear Bob:

Thanks for the copy of your retrospective article to be submitted to the *Journal of Organometallic Chemistry*. It made great reading.

I appreciate your kind references to my research group and me. I see nothing that needs modifying.

Thanks again for looking after me in May. Once again, thanks for organizing a great Gordon Conference. Have a good summer.

Sincerely,



John E. Bercaw

JEB:pa

VIRGINIA TECH

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July 6, 1990

Professor Robert G. Bergman
Department of Chemistry
University of California at Berkely
Berkely, California 94720

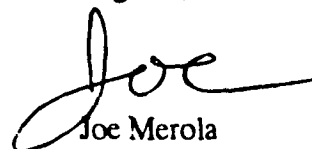
Dear Bob,

First, let me say that I found this years Organometallic Chemistry Gordon Conference to be the best one that I have attended. There is no single area that I can point to as the one that makes me feel that way, but I found that just in every area: quality of talks, organization, poster sessions, overall atmosphere, the conference was superb.

Thanks for your interest in our work here at VPI. I am sending you several things to inform you of our recent results. The first is a preprint of a communication that has been accepted by *Organometallics* on the B-H/Ir chemistry. The second is a preprint of a communication that has been accepted by *Inorganic Chemistry* on the N-H/Ir chemistry. Finally, I am also sending copies of the two posters I presented at the conference. Any comments and suggestions that you might have would be greatly appreciated.

Thanks again for a great Gordon Conference and I look forward to future discussions about iridium chemistry.

Regards,



Joe Merola